

$f_4(2300)$ $I^G(J^{PC}) = 0^+(4^{++})$

OMITTED FROM SUMMARY TABLE

This entry was previously called $U_0(2350)$. Contains results mostly from formation experiments. For further production experiments see the Further States entry. See also $\rho(2150)$, $f_2(2150)$, $\rho_3(2250)$, $\rho_5(2350)$.

NODE=M041

 $f_4(2300)$ MASS

NODE=M041

 $\bar{p}p \rightarrow \pi\pi$ or $\bar{K}K$

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

~2314	HASAN	94	RVUE $\bar{p}p \rightarrow \pi\pi$
~2300	1 MARTIN	80B	RVUE
~2300	1 MARTIN	80C	RVUE
~2340	2 CARTER	78B	CNTR 0.7–2.4 $\bar{p}p \rightarrow K^- K^+$
~2330	DULUDE	78B	OSPK 1–2 $\bar{p}p \rightarrow \pi^0 \pi^0$
~2310	3 CARTER	77	CNTR 0.7–2.4 $\bar{p}p \rightarrow \pi\pi$

1 $I(J^P) = 0(4^+)$ from simultaneous analysis of $p\bar{p} \rightarrow \pi^-\pi^+$ and $\pi^0\pi^0$.2 $I(J^P) = 0(4^+)$ from Barrelet-zero analysis.3 $I(J^P) = 0(4^+)$ from amplitude analysis.

NODE=M041205

NODE=M041M

NODE=M041M1

NODE=M041M1

S-CHANNEL $\bar{p}p$ or $\bar{N}N$

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

2283±17	4 ANISOVICH	00J	SPEC
~2380	5 CUTTS	78B	CNTR 0.97–3 $\bar{p}p \rightarrow \bar{N}N$
2345±15	5,6 COUPLAND	77	CNTR 0.7–2.4 $\bar{p}p \rightarrow \bar{p}p$
2359± 2	5,7 ALSPECTOR	73	CNTR $\bar{p}p$ S channel
2375±10	ABRAMS	70	CNTR S channel $\bar{N}N$

4 From the combined analysis of ANISOVICH 99C and ANISOVICH 99F on $\bar{p}p \rightarrow \eta\pi^0\pi^0$, $\pi^0\pi^0$, $\eta\eta$, $\eta\eta'$, $\pi^+\pi^-$.

5 Isospins 0 and 1 not separated.

6 From a fit to the total elastic cross section.

7 Referred to as U or U region by ALSPECTOR 73.

NODE=M041M1;LINKAGE=P

NODE=M041M1;LINKAGE=K

NODE=M041M1;LINKAGE=J

NODE=M041M2

NODE=M041M2

 $\pi^- p \rightarrow \eta\pi\pi\eta$

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

2330±20±40	AMELIN	00	VES $37 \pi^- p \rightarrow \eta\pi^+\pi^- n$
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NODE=M041M2;LINKAGE=AN

NODE=M041M2;LINKAGE=I

NODE=M041M2;LINKAGE=EE

NODE=M041M2;LINKAGE=M

NODE=M041M3

NODE=M041M3

 pp CENTRAL PRODUCTION

VALUE (MeV)	DOCUMENT ID	COMMENT
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2320±60 OUR ESTIMATE

• • • We do not use the following data for averages, fits, limits, etc. • • •

2332±15	BARBERIS	00F	450 $pp \rightarrow p_f \omega \omega p_s$
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NODE=M041M4

NODE=M041M4

→ UNCHECKED ←

NODE=M041210

NODE=M041W1

NODE=M041W1

 $f_4(2300)$ WIDTH **$\bar{p}p \rightarrow \pi\pi$ or $\bar{K}K$**

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

~278	HASAN	94	RVUE $\bar{p}p \rightarrow \pi\pi$
~200	8 MARTIN	80C	RVUE
~150	9 CARTER	78B	CNTR 0.7–2.4 $\bar{p}p \rightarrow K^- K^+$
~210	10 CARTER	77	CNTR 0.7–2.4 $\bar{p}p \rightarrow \pi\pi$

8 $I(J^P) = 0(4^+)$ from simultaneous analysis of $p\bar{p} \rightarrow \pi^-\pi^+$ and $\pi^0\pi^0$.9 $I(J^P) = 0(4^+)$ from Barrelet-zero analysis.10 $I(J^P) = 0(4^+)$ from amplitude analysis.

NODE=M041W1;LINKAGE=P

NODE=M041W1;LINKAGE=K

NODE=M041W1;LINKAGE=J

S CHANNEL $\bar{p}p$ or $\bar{N}N$

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
310 ± 25	11 ANISOVICH 00J	SPEC	
135 ± 150 - 65	12,13 COUPLAND 77	CNTR	0.7–2.4 $\bar{p}p \rightarrow \bar{p}p$
165 ± 18 - 8	13 ALSPECTOR 73	CNTR	$\bar{p}p$ S channel
~190	ABRAMS 70	CNTR	S channel $\bar{N}N$
11 From the combined analysis of ANISOVICH 99C and ANISOVICH 99F on $\bar{p}p \rightarrow \eta\pi^0\pi^0$, $\pi^0\pi^0$, $\eta\eta$, $\eta\eta'$, $\pi^+\pi^-$.			
12 From a fit to the total elastic cross section.			
13 Isospins 0 and 1 not separated.			

NODE=M041W2
NODE=M041W2 **$\pi^- p \rightarrow \eta\pi\pi\pi$**

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
235 ± 50 ± 40	AMELIN 00	VES	37 $\pi^- p \rightarrow \eta\pi^+\pi^- n$

NODE=M041W2;LINKAGE=AN

NODE=M041W2;LINKAGE=E
NODE=M041W2;LINKAGE=INODE=M041W3
NODE=M041W3 **$p\bar{p}$ CENTRAL PRODUCTION**

VALUE (MeV)	DOCUMENT ID	COMMENT
250 ± 80 OUR ESTIMATE		
• • • We do not use the following data for averages, fits, limits, etc. • • •		
260 ± 57	BARBERIS 00F	450 $p\bar{p} \rightarrow p_f\omega\omega p_s$

NODE=M041W4
NODE=M041W4
→ UNCHECKED ← **$f_4(2300)$ DECAY MODES**

Mode	Fraction (Γ_i/Γ)
Γ_1 $\rho\rho$	seen
Γ_2 $\omega\omega$	seen
Γ_3 $\eta\pi\pi$	seen
Γ_4 $\pi\pi$	seen
Γ_5 $K\bar{K}$	seen
Γ_6 $N\bar{N}$	seen

NODE=M041215;NODE=M041

 $f_4(2300)$ BRANCHING RATIOS

$\Gamma(\rho\rho)/\Gamma(\omega\omega)$	DOCUMENT ID	Γ_1/Γ_2
• • • We do not use the following data for averages, fits, limits, etc. • • •		
2.8 ± 0.5	BARBERIS 00F	450 $p\bar{p} \rightarrow p_f\omega\omega p_s$

DESIG=1;OUR EST;→ UNCHECKED ←
DESIG=2;OUR EST;→ UNCHECKED ←
DESIG=3;OUR EST;→ UNCHECKED ←
DESIG=4;OUR EST;→ UNCHECKED ←
DESIG=5;OUR EST;→ UNCHECKED ←
DESIG=6;OUR EST;→ UNCHECKED ←

NODE=M041220

NODE=M041R1
NODE=M041R1 **$f_4(2300)$ REFERENCES**

AMELIN 00	NP A668 83	D. Amelin <i>et al.</i>	(VES Collab.)
ANISOVICH 00J	PL B491 47	A.V. Anisovich <i>et al.</i>	
BARBERIS 00F	PL B484 198	D. Barberis <i>et al.</i>	(WA 102 Collab.)
ANISOVICH 99C	PL B452 173	A.V. Anisovich <i>et al.</i>	
ANISOVICH 99F	NP A651 253	A.V. Anisovich <i>et al.</i>	
HASAN 94	PL B334 215	A. Hasan, D.V. Bugg	(LOQM)
MARTIN 80B	NP B176 355	B.R. Martin, D. Morgan	(LOUC, RHEL) JP
MARTIN 80C	NP B169 216	A.D. Martin, M.R. Pennington	(DURH) JP
CARTER 78B	NP B141 467	A.A. Carter	(LOQM)
CUTTS 78B	PR D17 16	D. Cutts <i>et al.</i>	(STON, WISC)
DULUDE 78B	PL 79B 335	R.S. Dulude <i>et al.</i>	(BROW, MIT, BARII) JP
CARTER 77	PL 67B 117	A.A. Carter <i>et al.</i>	(LOQM, RHEL) JP
COUPLAND 77	PL 71B 460	M. Coupland <i>et al.</i>	(LOQM, RHEL)
ALSPECTOR 73	PRL 30 511	J. Alspector <i>et al.</i>	(RUTG, UPNJ)
ABRAMS 70	PR D1 1917	R.J. Abrams <i>et al.</i>	(BNL)

NODE=M041

REFID=47432
REFID=47950
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